

## Sujit Sen, PhD

Associate Professor  
Department of Chemical Engineering  
National Institute of Technology Rourkela  
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### Education

#### PhD, Chemical Engineering 2007 – 2011

Mentor: **Prof. Narayan C. Pradhan**, Indian Institute of Technology Kharagpur, India & **Prof. Anand V. Patwardhan**, Institute of Chemical Technology, Mumbai, India  
Dissertation: “**Multiphase Reactions: Phase Transfer Catalyzed Synthesis of Fine Chemicals using Hydrogen Sulfide**”

#### Master of Technology (M.Tech.), Chemical Engineering 2001 – 2003

Department of Chemical Engineering, University of Calcutta, Calcutta, India.  
Specilization: Petrochemicals & Petroleum Refinery Engineering  
First Class (73.2%).

#### Bachelor of Technology (B.Tech.), Chemical Engineering 1998 – 2001

Department of Chemical Engineering, University of Calcutta, Calcutta, India.  
First Class (79.8%).

#### Bachelor of Science (B.Sc.), Chemistry (Hons.) 1995 – 1998

Department of Chemistry, Bidhannagar College, University of Calcutta, Calcutta, India  
First Class (64.6%), Ranked 1<sup>st</sup> in College, 21<sup>st</sup> in State.

### Area of Expertise

1. Chemical Reaction Engineering: Heterogeneous Catalysis – Multiphase reactions, Green catalysis: Phase Transfer Catalysis, Ionic Liquid Catalysis.
2. Synthesis of Zeolites and Zeotype material and their application in wastewater treatment and fine chemical synthesis.
3. Synthesis of value-added Fine Chemicals and Petrochemicals from industrial waste materials.
4. Green Synthesis of Fine Chemicals.
5. Gas capture and utilization.
6. Advanced oxidation process in wastewater treatment
7. Membrane Separation in desalination

### Research Interest/Competency

My broad research interest focuses on heterogeneous catalysis and multiphase reactions. More specifically, the research on phase transfer catalysis, Green catalysis, Photocatalyst and sonocatalyst development for organic transformation and water research has been the focus area. Also, we target waste utilization to synthesis value added material using the above targeted research. Recently, I have acquired experience/expertise in some more areas as well.

a) **Green synthesis of value-added material under phase transfer catalysis:** The industrial toxic gas H<sub>2</sub>S have been captured and then utilized successfully in a multiphasic reaction in presence of Phase transfer catalyst/ionic liquid to yield 100% selective value added chemicals like thioethers, disulfides, amines etc. The technique can be used as an alternative to existing technique which create sulfur pollution and huge energy consumption. Future work aims at capture and utilization of another acid gas CO<sub>2</sub>, which is a major concern in today’s world due to its ever increasing rise in atmosphere.

b) **Development of Sonocatalyst and photocatalyst from industrial solid waste and its utilization:** Industrial solid waste like coal post-combustion fly-ash, red mud from aluminium industry, rice husk ask from rice-mill industries have been successfully utilized to prepare different nanoscale zeolites (X, Y, ZSM-5, EU-12 etc.) each of which is a versatile green material and can be utilized in

various applications such as energy storage, gas capture, wastewater treatment, catalysis etc. Nanozeolite has been modified by incorporating different metal oxide and sulfide to make sonocatalyst and photocatalysts which in turn, have been successfully employed in synthesis of biodiesel from non-edible and waste cooking oils, as well as many organic transformations as well as wastewater treatment to remove toxic heavy metals, dyes, organic contaminants etc. The process is cheap and green and the novel material can be utilized in many more versatile applications.

## Research Experience

### Senior Research Fellow

02/2007- 01/2009

Indian Institute of Technology, Kharagpur, India

Supervisor: Prof. N. C. Pradhan & Prof. A. V. Patwardhan

Sponsoring agency: Council of Scientific and Industrial Research (CSIR)

Synthesis of Value-Added chemicals like Dibenzyl Sulfide using Hydrogen Sulfide; Kinetic studies in both Atmospheric Batch reactors and High Pressure Autoclave; Kinetic modeling.

### Project Assistant- II (Senior Research Fellow)

10/2005 – 10/2006

Central Glass and Ceramic Research Institute, Jadavpur, India

Supervisor: Dr. Sibdas Bandhyopadhyay

Sponsoring agency: Department of Science and Technology (DST), India

Up-scaling and Pilot Plant Studies for removal of Iron from water using Ceramic Membrane

### Senior Research Fellow

04/2004 - 04/2005

Indian Institute of Technology, Kharagpur, India

Supervisor: Prof. N. C. Pradhan

Sponsoring agency: Ministry of Human Resource and Development (MHRD), India

Development of Catalyst for petroleum refining from fly ash, synthesis of zeolite catalyst from fly ash, characterization in SEM, XRD, modification of zeolite catalyst for Alkylation and Oxidation of aromatics.

## Teaching Experiences

- **Associate Professor** in the Department of Chemical Engineering at National Institute of Technology Rourkela, Odisha, India from **13<sup>th</sup> February 2020 till date**. Teaching Chemical Engineering to UG and PG students.
- **Assistance Professor** in the Department of Chemical Engineering at National Institute of Technology Rourkela, Odisha, India from **4<sup>th</sup> July, 2011 to 12<sup>th</sup> February 2020**. Teaching Chemical Engineering to UG and PG students.
- **Lecturer** in the Department of Chemical Engineering at Birla Institute of Technology Pilani, Pilani, Rajasthan, India from **8<sup>th</sup> April, 2011 to 31<sup>st</sup> June 2011**. Teaching Chemical Engineering to UG and PG students.

## Student Mentoring

**PhD: 3** (completed); **4** (ongoing) | **M.Tech (Research): 4** (Completed) | **M.Tech: 15** (Guided), **2** (ongoing)

**B.Tech.: 21** (Completed), **3** (ongoing)

### PhD Supervision:

Name of the student	Thesis title	Degree	Role	Status
Gaurav Singh	Phase Transfer Catalyzed Synthesis of Organosulfur fine Chemicals using Hydrogen Sulfide	PhD	Supervisor	Awarded 01/2017
Ujjal Mondal	Chemoselective Reduction of Nitroarenes using Hydrogen Sulfide under Phase transfer Catalysis	PhD	Supervisor	Awarded 02/2017
Sivamani S	Nanoscale Zeolite from Low-Cost Resources: Synthesis, Optimization and Application in Wastewater Treatment	PhD	Supervisor	Awarded 07/2019
Manisha Maharana	Zeolite-based photocatalysts for wastewater treatment	PhD	Supervisor	Ongoing (2017- )
Moumita Sardar	Membrane photocatalytic reactor for wastewater treatment	PhD	Supervisor	Ongoing (2019- )
Madhumita Manna	Membrane photobioreactor for wastewater treatment	PhD	Supervisor	Ongoing (2019- )
Deepti Pal	Sonophotocatalytic degradation of emerging pollutants	PhD	Supervisor	Ongoing (2019- )

### List of Masters (PG) Students Guided:

Student Name	Degree	Duration	Status
Meenakshee Pandey	M.Tech (Research)	2011-13	Awarded
Priya G nakade	M.Tech (Research)	2013-15	Awarded
Preeti Jha	M.Tech (Research)	2014-16	Awarded
Saroj Kumari	M.Tech (Research)	2015-17	Awarded
Srinivas Thadela	M.Tech.	2012-13	Awarded
Nagarjun S	M.Tech.	2012-13	Awarded
Dorothy Chetia	M.Tech.	2013-14	Awarded
Gajendra Kumar	M.Tech.	2013-14	Awarded
Aslam Puthankot	M.Tech.	2014-15	Awarded
Devipriya gogoi	M.Tech.	2014-15	Awarded
Tatinaidu kella	M.Tech	2015-16	Awarded
Prachiprava Pradhan	M.Tech	2017-18	Awarded
Neeraj Kumar Madhuriya	M.Tech.	2018-19	Awarded
Sanjeet Sanjay Patil	M.Tech	2019-20	Awarded
Pratik Mishra	M.Tech Dual	2015-16	Awarded
Annepushanmuk Kharavela	M.Tech Dual	2016-17	Awarded
Vishal Vasudevan	M.Tech Dual	2017-18	Awarded
Janani	M.Tech Dual	2018-19	Awarded
Ankita Behera	M.Tech Dual	2019-20	Awarded

### Laboratory Developed

1. **Catalysis Research Laboratory** (Functional): The laboratory is meant for development of various types of catalysts such as phase transfer catalysts, Solid zeolite catalysts etc. The laboratory has equipment like glass stirred reactors, packed bed reactors, Ultrasonic bath etc.
2. **Chromatography Laboratory** (Functional): The laboratory is developed to analyze organic samples using GC-FID, GC/MS, UV-VIS spectroscope etc.
3. **Green Technology Laboratory** (Under development): The laboratory is targeted to be used to develop environment friendly material and processes.

### Courses Taught

1. Reaction Kinetics and Catalysis (UG, Core)
2. Resource Recovery from Waste (PG, elective)
3. Chemical Process Calculation (UG, Core)
4. Petroleum Refinery Engineering (UG, Elective)
5. Chemical Process Technology (UG, Core)
6. Green Engineering and Technology (PG, Elective)
7. Advanced Reaction Engineering (PG, Core)
8. Basic Chemical Engineering (UG/PG, Open elective)
9. Seminar and Technical Writing (UG/PG/PhD)
10. Environmental and Safety Engineering (UG, 1<sup>st</sup> year)

### Courses Developed/Introduced

1. Green Technology and Engineering (PG)
2. Research Methodology (PG)
3. Resource Recovery from Waste (PG)

### Instrumental Skills

- Analytical Techniques: Gas Chromatography-Mass Spectroscopy (GC/MS), High Pressure Liquid Chromatography (HPLC), Atomic Absorption Spectroscopy (AAS), SEM, XRD, FTIR.
- Reactors: Batch Reactors (glass), High Pressure Autoclave, Packed-bed Flow Reactor, Membrane Photoreactor.

## Research Publications

1. Sivamani Sivalingam, **Sujit Sen**, "Sono-assisted adsorption of As (V) from water by rice husk ash derived iron modified mesoporous zeolite Y: A Cradle to cradle solution to a problematic solid waste materials", *Ind. Eng. Chem. Res.* 2019, 58, 14073-14087. DOI: 10.1021/acs.iecr.9b01785 (I.F. 3.573).
2. Sivamani Sivalingam, **Sujit Sen**, "Efficient removal of textile dye using nanosized fly ash derived Zeolite-X: Kinetics and process optimization study", *J. Taiwan. Inst. Chem. Eng.* 2019, 96, 305-314. DOI: 10.1016/j.jtice.2018.10.032 (I.F. 4.794)
3. Sivamani Sivalingam, Sujit Sen, "Valorization of coal fly ash into nanozeolite by sonication assisted hydrothermal method", *J Environ Manage.* 2019, 235, 145-151. DOI: [10.1016/j.jenvman.2019.01.042](https://doi.org/10.1016/j.jenvman.2019.01.042) (I.F. 5.647).
4. Sivamani Sivalingam, Taitinaidu Kella, Manisha Maharana, **Sujit Sen**, "Efficient sono-sorptive elimination of methylene blue by fly ash-derived nano-zeolite X: Process optimization, isotherm and kinetic studies", *J Clean. Prod.* 2019, 219, 1241-1254. DOI: [10.1016/j.jclepro.2018.10.200](https://doi.org/10.1016/j.jclepro.2018.10.200) (I.F. 7.246)
5. Sivamani Sivalingam, **Sujit Sen**, "An ultra-fast non-conventional waste management protocol to recycle of industrial fly ash into zeolite X", *Environ Sci Pollut Res Int.* 2018, 26(34), 34693-34701. DOI: 10.1007/s11356-018-3664-9 (I.F. 3.056).
6. Pratik Mishra, Saroj Kumari, **Sujit Sen**, "Kinetic Modeling on Ionic Liquid Mediated Bi-liquid Phase Transfer Catalyzed Synthesis of bis-(2-Phenylethyl) Sulfide with H<sub>2</sub>S-rich Methyl-diethanolamine", *J Mol Liq.* 2018, 271, 580-588. (I.F. 5.065)
7. Sivamani Sivalingam, **Sujit Sen**, "Swift sono-hydrothermal synthesis of pure NaX nanocrystals with improved sorption capacity from industrial resources", *Appl. Surf. Sci.* 2019, 463, 190 - 196. (I.F. 6.182)
8. Sivamani Sivalingam, **Sujit Sen**, "Rapid ultrasound assisted hydrothermal synthesis of highly pure nanozeolite X from Fly ash for efficient treatment of industrial effluent", *Chemosphere.* 2018, 210, 816-823. DOI: [10.1016/j.chemosphere.2018.07.091](https://doi.org/10.1016/j.chemosphere.2018.07.091) (I.F. 5.778)
9. Sivamani Sivalingam, **Sujit Sen**, "Optimization of synthesis parameters and characterization of coal fly ash derived microporous zeolite X", *Appl. Surf. Sci.* 2018, 455, 903-910. DOI: [10.1016/j.apsusc.2018.05.222](https://doi.org/10.1016/j.apsusc.2018.05.222) (I.F. 6.182)
10. Ujjal Mondal, **Sujit Sen**, "Highly Selective Room Temperature Monoreduction of Dinitro-arenes by Hydrogen Sulfide under Liquid-Liquid Biphasic Catalysis", *Int J Chem Kinet.* 2018, 50(1), 15-30. (I.F. 1.531)
11. Ujjal Mondal, **Sujit Sen**, "Multivariate Analysis in Selective Nitroacetophenone Conversion by Hydrogen Sulfide under Phase Transfer Catalysis", *Org. Process Res. Dev.* 2017, 21 (1), 23-30. (I.F. 3.023)
12. **Sujit Sen**, Ujjal Mondal, Gaurav Singh, "Dual Optimization in Phase Transfer Catalyzed Synthesis of Dibenzyl Sulfide using Response Surface Methodology (RSM)", *Org. Process Res. Dev.* 2016, 20 (10), 1765-1773. (I.F. 3.023)
13. Preeti Jha, Ujjal Mondal, Devipriya Gogoi, Gaurav Singh, **Sujit Sen**, "Novelties of selective triphasic synthesis of bis-(p-chlorobenzyl) sulfide using hydrogen sulfide and reusable phase transfer catalyst", *J Mol. Catal. A: Chem.* 2016, 418, 30-40. DOI: [10.1016/j.molcata.2016.03.030](https://doi.org/10.1016/j.molcata.2016.03.030) (I.F. 4.397)
14. Gaurav Singh, Priya G. Nakade, Dorothy Chetia, Preeti Jha, Ujjal Mondal, Saroj Kumari, **Sujit Sen**, "Kinetics and mechanism of phase transfer catalyzed synthesis of aromatic thioethers by H<sub>2</sub>S-rich Methyl-diethanolamine", *J Ind. Eng. Chem.* 2016, 37, 190-197. DOI: [10.1016/j.jiec.2016.03.022](https://doi.org/10.1016/j.jiec.2016.03.022) (I.F. 5.278)
15. Gaurav Singh, Priya G. Nakade, Pratik Mishra, Preeti Jha, **Sujit Sen**, Ujjal Mondal, "Kinetic investigation on liquid-liquid-solid phase transfer catalyzed synthesis of dibenzyl disulfide with H<sub>2</sub>S-laden monoethanolamine", *J Mol. Catal. A: Chem.* 2016, 411, 78-86. DOI: [10.1016/j.molcata.2015.10.013](https://doi.org/10.1016/j.molcata.2015.10.013) (I.F. 4.397)
16. Ujjal Mondal, Aslam Puthankot, **Sujit Sen**, Gaurav Singh, "Novelties of triphasic phase transfer catalyzed Zinin reduction of nitrochlorobenzene by H<sub>2</sub>S-laden monoethanolamine", *RSC Adv.* 2016, 6, 23666-23676. DOI: 10.1039/C5RA26856G (I.F. 3.119)

17. Ujjal Mondal, **Sujit Sen** and Gaurav Singh, "Advances in hydrogen sulphide utilisation: phase transfer catalysed selective reduction of nitronaphthalene", *RSC Adv.*, 2015, 5, 102942-102952. DOI: [10.1039/C5RA19884D](https://doi.org/10.1039/C5RA19884D) (I.F. 3.119)
18. **Sujit Sen**, Narayan C. Pradhan and Anand V. Patwardhan, "Kinetics of Reaction of Benzyl Chloride with H<sub>2</sub>S-rich Aqueous Monoethanolamine: Selective Synthesis of Dibenzyl Sulfide under Liquid-Liquid Phase-Transfer Catalysis", *Asia-Pac. J. Chem. Eng.* 2011, 6 (2), 257-265. DOI: [10.1002/apj.430](https://doi.org/10.1002/apj.430) (I.F. 1.06)
19. Sunil K. Maity, **Sujit Sen** and Narayan C. Pradhan, "A New Mechanistic Model for Liquid-Liquid Phase Transfer Catalysis: Reaction of Benzyl Chloride with Aqueous Ammonium Sulfide", *Chem. Eng. Sc.*, 2009, 64, 4365-4374. DOI: [10.1016/j.ces.2009.07.004](https://doi.org/10.1016/j.ces.2009.07.004) (I.F. 3.871)
20. **Sujit Sen**, Sunil K. Maity, Narayan C. Pradhan and Anand V. Patwardhan, "Utilization of Hydrogen Sulfide for the Synthesis of Dibenzyl Sulfide: Effect of Process Parameters on Conversion and Selectivity", *Int. J. chem. Sci.* 2007, 5 (4), 1569-1578.
21. Sanjeet Sanjay Patil, Balasubhramaniam P, **Sujit Sen**, "Performance evaluation of bubble column photobioreactor along with CFD simulations for microalgal cultivation using human urine", *Under Review*, 2020.
22. Sivamani Sivalingam, **Sujit Sen**, "Rice-Husk derived Nano-ZSM-5 for the removal of dyes from water", *Under review*, 2020.
23. Saroj Kumari, **Sujit Sen**, "Ionic liquid as biphasic amphiphilic catalyst in rapid solvent-free synthesis of symmetrical aromatic sulphide utilizing hydrogen sulphide", *Under review*, 2020.
24. Ujjal Mondal, **Sujit Sen**, "Hydrogen sulphide as a highly efficient reducing agent for chemoselective reduction of substituted nitroarenes under liquid-liquid phase transfer catalysis", *Under review*, 2020.
25. Vibhuti A. Dukhande, Meghana S. Wasnik, Shreerang V. Joshi, Anand V. Patwardhan, **Sujit Sen**, "Selective esterification of acid oil using ionic liquid as catalyst", *Under review*, 2020.
26. Vishal Vasudevan, Manisha Maharana, Prachi Prava Pradhan, **Sujit Sen**, "Heterogenous Photo-degradation of Nitro-aromatics using NiS-Zeolite 13X: Experimental study, Optimisation, Modeling and Automation", *Under review*, 2020.
27. Prachiprabha Pradhan, Manisha Maharana, Vishal Vasudevan, **Sujit Sen**, "NiS-NaX as a green efficient catalyst in photocatalytic degradation of cationic dyes", *Under review*, 2020.
28. Preeti Jha, **Sujit Sen**, "Process Optimization in Synthesis of Symmetrical Thioethers: Selective Triphasic Sulfidation using Hydrogen sulphide", *Under review*, 2020.

#### National/International Conferences

1. Manisha Maharana, Janani J, **Sujit Sen**, "Utilization of Coal Fly Ash derived Magnetic Geopolymers as Reusable Catalyst in Biodiesel Synthesis from Non-edible oil", Indian Chemical Engineering Congress (**CHEMCON-2019**), IICHE, IIT Delhi, December 16-19, 2019.
2. Sivamani S, **Sujit Sen**, "Rice Husk Ash Derived Nanocrystalline Zeolite for Water Research: Waste Disposal to Resource Recovery" **RSW-2017**, NIT Rourkela, Odisha, India. February 21-23, 2017.
3. Sivamani S, **Sujit Sen**, "Resource Recovery of Waste Fly-ash in Synthesis of Zeolite", Indian Chemical Engineering Congress (**CHEMCON-2016**), Anna University, Chennai, India, **December 27-30, 2016**.
4. Sivamani S, **Sujit Sen**, Utilization of waste fly ash for the synthesis of potential catalyst, **STCE-2016**, The Institution of Engineers (India), NIT Rourkela, Odisha, India. February 13-14, 2016.
5. Sivamani S, **Sujit Sen**, "Zeolite ZSM-5 formation by hydrothermal alkali fusion of coal fly ash", Indian Chemical Engineering Congress (**CHEMCON-2015**), IIT-Guwahati, India, **December 27-30, 2015**.
6. Sivamani S, and Sujit Sen, Synthesis and characterization of zeolite X and its application on alkylation reaction, **PETRAMET' 15**, AMET University Chennai, India, April 21-22, 2015.

7. Sivamani S, **Sujit Sen**, "Solid Waste Converted into Catalyst and Its Application in Heterogeneous Catalysis", International Conference on New Frontiers in Chemical, Energy & Environmental Engineering (**INCEEE**), Warangal, March 20-21, 2015, ISBN 978-81-928314-1.
8. Gaurav Singh, Priya G. Nakade, Preeti Jha, Devipriya Gogoi, **Sujit Sen**, "Parametric Studies in Synthesis Aromatic Thioethers using Hydrogen Sulfide Under Liquid Liquid Phase Transfer Catalyst", Indian Chemical Engineering Congress (**CHEMCON-2014**), Chandigarh, Punjab, India, December 27-30, 2014.
9. Ujjal Mondal, **Sujit Sen**, Gaurav Singh, Priya G. Nakade, "H<sub>2</sub>S-Rich Alkanolamine: A New Reagent For Zinnin Reduction", Indian Chemical Engineering Congress (**CHEMCON-2013**), Matunga, Mumbai, India, December 27-30, 2013.
10. Gaurav Singh, **Sujit Sen**, Ujjal Mondal, Priya G. Nakade, "Synthesis of Symmetrical Thioethers from Hydrogen Sulfide", Indian Chemical Engineering Congress (**CHEMCON-2013**), Matunga, Mumbai, India, December 27-30, 2013.
11. Meenakshee Pandey, **Sujit Sen**, "Enzyme-Catalysed Hydrolysis of non-conventional oil resources:A Review", Indian Chemical Engineering Congress (**CHEMCON-2012**), Jalandhar, Punjab, India, December 27-30, 2012.
12. S. Nagarjun, **Sujit Sen**, Srinivas Thadela, "Room Temperature Synthesis of Dibenzyl Sulfide using PEG as a Green Catalyst", Indian Chemical Engineering Congress (**CHEMCON-2012**), Jalandhar, Punjab, India, December 27-30, 2012.
13. Srinivas Thadela, **Sujit Sen**, S. Nagarjun, "Green Route of Synthesis of Dibenzyl Thioether using Hydrogen sulfide", Indian Chemical Engineering Congress (**CHEMCON-2012**), Jalandhar, Punjab, India, December 27-30, 2012.
14. Gaurav Singh, Priya G. Nakade, **Sujit Sen**, "Green Routes of Synthesis of Organic Sulphides: A Review", Indian Chemical Engineering Congress (**CHEMCON-2012**), Jalandhar, Punjab, India, December 27-30, 2012.
15. **Sujit Sen**. "Selective reduction of Chloronitrobenzene using H<sub>2</sub>S-rich Monoethanolamine: Kinetic studies and optimization", 243<sup>rd</sup> ACS National Meeting & Exposition, San Diego, California, **March 25-29, 2012**.
16. **Sujit Sen**. "Selective Synthesis of Dibenzyl Thioether under Solvent free condition using Hydrogen Sulfide", 243<sup>rd</sup> ACS National Meeting & Exposition, San Diego, California, **March 25-29, 2012**.
17. **Sujit Sen**, Narayan C. Pradhan and Anand V. Patwardhan, "Optimization of Benzyl Chloride Conversion in Liquid-Liquid Phase Transfer Catalyzed Reaction with H<sub>2</sub>S-Rich Monoethanolamine", **International Conference on Chemistry and Chemical Process – ICCCP 2011**, Bangkok, Thailand, **May 7-9, 2011**.
18. **Sujit Sen**, Narayan C. Pradhan and Anand V. Patwardhan, "Reactions of Benzyl Chloride with H<sub>2</sub>S-rich Ethanolamine under Phase Transfer Catalysis: Optimization of Product Selectivity by Response Surface Methodology", **Chemical Engineering Congress (CHEMCON, International conference)-2010**, Annamalainagar, India, **December 27-29, 2010**.
19. **Sujit Sen** and Narayan C. Pradhan, "Intensification and Selectivities in Liquid-Liquid Phase-Transfer-Catalyzed Synthesis of Dibenzyl sulfide using Hydrogen Sulfide", **ChemBiotech'09-10** (International Conference), National University of Singapore, Singapore (NUS), **January 28-29, 2010**.
20. **Sujit Sen**, Narayan C. Pradhan and Anand V. Patwardhan, "Role of Phase Transfer Catalyst in Biphasic Liquid-Liquid Reactions of Benzyl Chloride and Aqueous Ammonium Sulfide", Chemical Engineering Congress (**CHEMCON, International Conference**), Visakhapatnam, India, **December 27-30, 2009**.
21. **Sujit Sen**, Narayan C. Pradhan and Anand V. Patwardhan, "Solvent-free Selective Synthesis of Dibenzyl Sulfide using Hydrogen Sulfide: Role of Phase Transfer Catalyst", **ChemBiotech'08** (Regional Conference), National University of Singapore (NUS), Singapore, **December 19-20, 2008**.
22. **Sujit Sen**, Narayan C. Pradhan and Anand V. Patwardhan, "Kinetics of Reactions of Benzyl Chloride with H<sub>2</sub>S-rich Aqueous Monoethanolamine under Liquid-liquid Phase Transfer Catalysis", Chemical Engineering Congress (**CHEMCON, International Conference**), Kolkata, India, **December 27- 30, 2007**.
23. **Sujit Sen**, Sunil K. Maity, Narayan C. Pradhan and Anand V. Patwardhan, "Utilization of Hydrogen Sulfide for the Synthesis of Dibenzyl Sulfide: Effect of Process Parameters on Conversion and Selectivity", National Conference on Frontiers in Chemical Engineering (**NCFCE**), IIT-Guwahati, India, **December 12-14, 2007**.

#### Book Chapters

1. Sardar, M., Maharana, M., Manna, M. and **Sen, S.** (2020). 2D Zeolites. *In* Inamuddin, Boddula, R., Ahamed, M.I., Asiri, A.M. (Eds.), *Layered 2D Advanced Materials and Their Allied Applications*. Wiley. DOI:[10.1002/9781119655190.ch9](https://doi.org/10.1002/9781119655190.ch9)

- Maharana, M., Manna, M., Sardar, M., **S. Sen** (2020). Heavy Metal removal by Low Cost Adsorbents. *In* Inamuddin, Ahamed, M.I., Lichtfouse, E., Asiri, A.M. (Eds.), *Green Adsorbents to Remove Metals, Dyes and Boron from Polluted Water*. Springer. DOI: 0.1007/978-3-030-47400-3.
- Sardar, M., Manna, M., Maharana, M. and **Sen, S.** (2020). Dye removal by low cost adsorbents, *In* Inamuddin, Ahamed, M.I., Lichtfouse, E., Asiri, A.M. (Eds.), *Green Adsorbents to Remove Metals, Dyes and Boron from Polluted Water*. Springer. DOI: 0.1007/978-3-030-47400-3.
- Nakade, P. G., Singh, G. and **Sen, S.** (2020) Tri-Liquid Phase Transfer Catalysis: A Green Reaction Technology. *In* Inamuddin (eds) *Green Sustainable Process for Chemical and Environmental Engineering and Science*, 1st Edition. Elsevier. *Accepted*.

#### National/International Workshop/Seminar Participated

- Faculty Development programme In "*Pedagogy and E-Learning Technology*", Conducted by Electronics and Communication Department, NIT Rourkela, **July 1-5, 2014**.
- Academic Training "*GC/MS: Fundamental and Application*" at Agilent Central Facility Laboratory, Bangalore, India, **June 20-21, 2013**.
- Industry-Academia Workshop on "*Simulation & Modeling in the Process Industry*", conducted by Petroleum Federation of India (PETROFED), Lovraj Kumar Memorial Trust (LKMT) in association with Indian Oil Corporation Ltd., at IMA, Haldia Refinery, West Bengal, India, **July 25 – 28, 2012**.
- Workshop on "*Data Analysis and Modeling*" organized on occasion of the 1<sup>st</sup> National Conference of Research Scholars and Young Scientist in Chemical Engineering (**CRSYS, 2004**), IIT- Kharagpur, India, **September 25-27, 2004**.

#### Sponsored Project Handled

1 Title: *Two stage synthesis of aromatic thioethers using hydrogen sulfide and reusable phase transfer catalyst*

Principal Investigator: **Prof. Sujit Sen**

**Scheme: Fast-Track**

Sponsor: **SERB, DST**

Project Value: **INR 24.62 Lakhs**

Duration: **Jul 2013 to Jul 2016**

Status: **Completed**

2. Title: *Zeolite-based Low-cost Hybrid Membrane Photo-Bioreactor System for Treating and Recycling of High Strength Industrial Wastewater*

Principal Investigator: **Prof. Sujit Sen**

Co-PIs: Prof. Binay K. Dutta (IIT Kharagpur), Prof. Anand V. Patwardhan (ICT Mumbai), Prof. Papita Das (Jadavpur University), Prof. Surajit Das (NIT Rourkela)

Scheme: **IMPRINT 2**

Sponsor: **DST-MHRD**

Project Value: **INR 88.21 Lakhs**

Duration: **Jan 2019 to Mar 2022**.

Status: **Ongoing**

#### Membership/Fellowship in Professional Societies

- |  |             |
|--|-------------|
| 1. <b>Member, American Institute of Chemical Engineers (AIChE)</b><br>Membership No. 009900312848                                  | <b>2016</b> |
| 2. <b>Member, American Chemical Society (ACS)</b><br>Membership No.30225127  | <b>2012</b> |
| <b>Senior Member, Asia-Pacific Chemical, Biological &amp; Environmental Engineering Society (APCBEEES)</b> , Membership No. 100641 | <b>2013</b> |
| 3. <b>Associate Member, Institution of Engineers of India (IEI)</b><br>Membership No. AM145724-4                                   | <b>2013</b> |
| 4. <b>Life Member, Indian Institute of Chemical Engineers (IICChE)</b><br>Membership No. LM-39328                                  | <b>2011</b> |
| 5. <b>Member, International Association of Engineers (IAENG)</b><br>Membership No. 111742  | <b>2014</b> |

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|---|------|
| 6. Senior Member, International Association of Computer Science and Information Technology (IACSIT), Membership No. 80347093  | 2015 |
| 7. Member, Universal Association of Civil, Structural And Environmental Engineers (UACSE), Institute of Research Engineers and Doctors<br>Membership ID: SNM10100058006 | 2016 |

#### Award/Honor/Fellowships/Achievements

1. **2019 Class of Influential Researchers**, Industrial & Engineering Chemistry Research (ACS).
2. **Fast Track for Young Scientist Award** from Science & Engineering Research Board, Department of Science and Technology (DST), India for the year 2013.
3. **Doctoral Fellowship** from **Ministry of Human Research and Development (MHRD)** for PhD, (02/2009 – 01/2011)
4. **Research Fellowship (SRF)** from **Council of Scientific and Industrial Research Fellowship (CSIR), India** for Research, (02/2007 – 01/2009).
5. **Research Fellowship (SRF)** from **Department of Science and Technology (DST), India** for Research, (10/2005 – 10/2006).
6. **Research Fellowship (SRF)** from **Council of Scientific and Industrial Research Fellowship (CSIR), India** for Research, (04/2004 – 04/2005).
7. **92.12 percentile in Graduate Aptitude Test in Engineering (GATE)-2002, AIR – 353.**
8. **College Topper in B.Sc. in Chemistry (Honors)** from Bidhannagar College, Calcutta University, India in 1995 (**21<sup>st</sup> rank** in State).

#### Academic/Administrative Responsibilities

1. **Convener** for “*Students’ Chemical Engineering Congress (SCHEMCON) 2017*”, Department of Chemical Engineering, National Institute of Technology Rourkela, Odisha, India, **October 7 – 8, 2017.**
2. **Convener** for “*International Conference on Frontiers in Chemical Engineering (ICFCE-2013)*”, Department of Chemical Engineering, National Institute of Technology Rourkela, Odisha, India, **December 9 – 11, 2013.**
3. **Convener** for “*Golden Jubilee Chemical Engineers Alumni Meet-2014*”, Department of Chemical Engineering, National Institute of Technology Rourkela, Odisha, India, **December 24 – 25, 2013.**
4. **Convener** for **National Conference in “Recent Advances in Chemical & Environmental Engineering”**, Department of Chemical Engineering, National Institute of Technology Rourkela, Odisha, India, **January 20 – 21, 2012.**
5. **Professor-in-charge** of Department Information, since **07/2018.**
6. **Member of Central Library Advisory Committee**, Biju Patnaik Central Library, National Institute of Technology Rourkela, from **07/2016 – 07/2017.**
7. **Member of Doctoral Research Committee (DRC)**, Department of Chemical Engineering, National Institute of Technology Rourkela, Odisha, India from **07/2014 – till date.**
8. **Professor-in-Charge** of Department Infrastructure, from **07/2014 – 06/2018.**
9. **Faculty Advisor** of 2013-2017 Batch of UG Chemical Engineering and Food Processing Engineering.
10. **Assistant Warden**, M.V. Hall of Residence, NIT Rourkela, India from **07/2012 – 06/2015.**
11. **Member of Website Development Committee** of the Institute from **07/2012 – till date.**
12. **Faculty Advisor of Vortex Club, Student Activity Centre (SAC) since July 2012.**
13. **Representative of Research Scholars** at Department of Chemical Engineering, IIT Kharagpur, India, from **01/ 2009 – 03/ 2011.**
14. **Member of Department Accreditation Committee** since **07/2018**
15. **Member of Central Curriculum Development Committee** from **07/2016-06/2018**
16. **Member of Curriculum, Ranking and Accreditation Committee** from **07/2017 – 06/2020**

#### Academic Outreach Activities

1. **Student Chapter Coordinator** for **Indian Institute of Chemical Engineers (IIChE)** Regional Centre, Rourkela since **07/2016 – 06/2019.**
2. **Joint Secretary** for **Indian Institute of Chemical Engineers (IIChE), Rourkela** Regional Centre Since 07/2019.
3. **Department Chair & Faculty Advisor** for **American Institute of Chemical Engineers (AIChE)** Student Chapter, Rourkela since **07/2016 – till date.**
4. **Reviewer** of several DST Early Career Research Proposals.



5. **Reviewer** of many renowned international journals like Catalysis Communication (Elsevier), Organic Process Research and Development (ACS), ACS Sustainable Chemistry and Engineering, Journal of Hazardous Material (Elsevier), Energy & Fuels (ACS) etc.
6. **Invited Talk** on “Fly-Ash Management in India: From Waste Disposal to Resource Recovery” during TEQIP-II sponsored short term course on “Industrial and Municipal Waste Management (I&MWM-2017), held at NIT Rourkela, January 24 – 25, 2017.
7. **Lecture** on “Process Plant Safety and Environment” at Jindal Steel, Vijayanagar Works, Toranagallu, Karnataka, June 4-5, 2011.

## References

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